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## Article

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# Remittance patterns in Eastern Europe and the World

Elliott Parker\*, Martin Piotrowski\*\*

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## Abstract

This paper examines both inflows and outflows of remittances for 21 countries of Eastern Europe and the Former Soviet Union, relative to a larger sample of 93 countries with available data on bilateral flows. For the greater sample, we find evidence that larger populations of migrants, and greater concentrations of migrants, are associated with diminishing remittances per migrant. We also find that ethnically fractionalized countries have smaller remittance flows, all things being equal. However, we find that the subsample of former socialist countries deviates significantly from the rest of the sample. In particular, the correlation between remittances per migrant and changes in population and the rural share of population is very different, which we argue is driven by the particular inefficiencies of the rural sector in these economies.

JEL classification: C23, F22, F32

Keywords: Immigration, Remittances, Eastern Europe

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## 1. Introduction

In this study we examine macro-level determinants of migrant remittances for a sample of 93 countries, with a particular focus on how Eastern Europe and the Former Soviet Union might differ from other countries. Our dataset is a balanced panel running from 1995, a time after the formerly socialist economies had significantly liberalized, to 2019, the year before the CoVID-19 pandemic disrupted immigration patterns, economic growth, and the behavior of remittances. In the quarter century in between these events, enormous social changes took place in this region.

We consider remittance flows both from the perspective of sending and receiving countries. Migrant remittances, defined as financial transfers between migration-sending and receiving countries, represent a significant flow of capital that dwarfs official development aid and are a more stable flow than direct foreign investment (Yang, 2011). According to the World Bank (2020), personal remittances received by all countries totaled 653 billion USD in 2019. Of course, these data only include reported remittances, and migrants may also be able to shift their savings informally, in ways that aren't well measured.

Remittances are particularly significant for the former socialist economies of Eastern Europe (EE) and the Former Soviet Union (FSU) following the dissolution of

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the Soviet economic system in the early 1990s and the transition to more market-based economies. International migration flows within the region, following the formation of new nations, the relaxation of border controls, and the integration of many EE countries into the European Union (EU), represent some of the world's largest mass movements of people. These flows can be broadly categorized bi-axially into a Western part of the region to the EU and another axis involving migration from the republics of the FSU, and thus have had a significant impact on economic growth and development (Mansoor and Quillin, 2006).

In what follows we review the literature on migrant remittances, including both general considerations and trends specific to the EE/FSU region. We follow that with a description of our data and sample, operationalization of key variables, empirical modeling strategy, results, and conclusions.

Our results show consistently that there is a diminishing effect to remittances; a country with a larger share of emigrants will receive fewer remittances per emigrant, and a country with a larger share of immigrants will pay fewer remittances per immigrant. There is also some evidence that concentration matters, in that remittances diminish when emigrants concentrate in fewer countries, or immigrants come from fewer countries. An overvalued exchange rate leads to more remittances paid, but does not significantly affect remittances received. Finally, there is evidence that the formerly socialist economies of Eastern Europe both receive less and pay less in remittances, once other factors are accounted for, but this does not appear to apply to other republics of the former Soviet Union.

## **2. Background**

Much of the macroeconomic research on migrant remittances has focused on its consequences for sending countries, such as poverty and inequality reduction (Adams and Page (2005); Mehedintu et al. (2019); Pedovic (2017)) and financial and economic development (Aggarwal et al. (2011); Guiliano and Ruiz-Arranz (2009)), however, in comparison to micro-level research, relatively less research has considered the macrolevel determinants of remittances. What limited research on the macroeconomic determinants of migrant remittances exists focuses on such factors as the number of workers, wage rates and overall economic situation in the host or origin country, the

exchange rates and relative interest rate between the sending and receiving country, and transfer costs and exchange rate restrictions (see Hagen-Zanker and Siegel (2007) for review, or individual studies such as Freund and Spatafora (2008)). The determinants of migrant remittances have mostly been considered at the micro-level and include a number of underlying motivations for why such sending exists. Insofar as macro patterns represent the aggregation of micro-level processes, they can be understood from these perspectives.

## **2.1. The New Economics of Migration**

A groundbreaking paper by Lucas and Stark (1985) introduced the idea of “tempered altruism” or “enlightened self-interest” to describe migrants’ motivation for engaging in remittances exchanges with their origin households. Their approach represented a middle-ground between altruistic approaches to understanding remittances and pure self-interested motivations. From the perspective of the former, migrants derive positive utility from the consumption behavior of their families (in the Beckerian sense) and thus care about such factors as poverty, exogenous shocks, and factors associated with the origin households’ well-being. According to the latter, migrants send remittances with the anticipation of gaining something in return, such as the inheritance of property. Thus, remittances can be used to entice migrants to remit back to their home households (de la Briere et al., 2002; Hoddinot, 1994), especially if they possess desirable assets, such as land, property, livestock, and the like.

Under a “tempered altruism” motive, both altruism and self-interest play a role in remittances, in the sense that migration and remittances are part of a kind of mutually beneficial implicit contract. Such a contract is self-enforcing and takes the form of a coinsurance scheme. For one example, the migrant helps protect the origin household against shocks and economic downturns, and the household protects the migrant from the risk of unemployment and offers a potential return option). This may also involve loan repayments, including investments in the migrant’s education (Brown and Poirine, 2005), or an exchange of services such as childcare provided by extended family to absent migrant parents (Cox, 1987).

Lucas and Stark (1985) added an important element in the development of the so-called “New Economics of Labor Migration” (see Massey et al., 1993; Hagen-Zanker and Siegel, 2007; or Carling, 2008), which has a number of central premises,

1. Decisions about remittances are linked with decisions about migration and made at the household level. This idea contrasts with (but is not mutually exclusive of) other approaches to explaining migration, such as the Harris and Todaro (1970) model of migration, whereby migration is driven by expected (rather than actual) wage differentials between place of origin and destination.
2. Household strategies involving migration are a reaction to market failures (e.g., in credit, insurance, and futures markets) in source countries that prompt migrating household members to move to areas characterized by non-correlated labor markets (e.g., rural vs urban), creating opportunities for investment (i.e., in housing, small businesses and agricultural mechanization which improves farm productivity) and risk diversification.

Thus, factors such as poor economic conditions at origin (e.g., poverty, high unemployment, low wages, or lack of access to capital) represent the underlying factors encouraging migration, and migrants act as target earners that make up for market failures. Later work in this tradition also linked household remittances to both relative and absolute income considerations (Stark and Taylor, 1989), suggesting that a sense of relative deprivation is an important consideration in household migration decisions.

## **2.2. Remittance Decay**

Migration origin (demand-side) factors aside, research has also considered temporal changes in remittance patterns, which inevitably involves considerations about migration-destination (or supply-side) factors. Specifically, a major theme in the remittance literature revolves around the so-called *remittance decay hypothesis*, the notion that remittances decline with the passage of time. Arguments in favor of remittance decay point to such mechanisms as weakening altruism as family ties loosen over time and distance (Farzanegan et al., 2017), reunification with dependents in the host country resulting in increasingly fewer needy recipients to assist at home (Poirine, 2006), and greater integration and earnings of migrants in the host communities (Cohen, 2011). Empirical evidence for decay is mixed (Carling, 2008), with some research finding no

time effect (e.g., Brown and Poirine, 2005) and much of the evidence in favor finding an inverted U-shaped pattern over time (e.g., Makina and Masenge, 2015; Poirine and Dropsy, 2019), whereby remittances increase and peak within the first 6-8 years of absence and then gradually decline.

However, interpretation of time effects in econometric analysis is sensitive to the inclusion of other variables in analysis (such as controls for transnational family structure and migrant income at destination) and is further complicated by the difficulty of disentangling effects of age, length of stay, and period of migration; although Amuedo-Dorantes and Pozo (2006) were able to differentiate between effects of period of entry and length of residence in their study of Mexican migrants in the United States. Furthermore, as demonstrated by a study of Southeast Asian migrants in the UK (Arun and Ulku, 2011), the decay phenomenon can differ across ethnic groups, with for example, strong evidence for remittance decay for Indian and Pakistani migrants, but not for Bangladeshi migrants.

The implication for our research is that not only are economic conditions at origin of importance to understanding remittance patterns at the macro level, but also central are destination-context factors such as the size, composition, and human capital endowments of migrants, as well as changes over time.

### **2.3. Migrations and Remittances in Eastern Europe and the Former Soviet Union**

We now consider how some of these factors may be operating in parts of Eastern Europe and the Former Soviet Union, in particular in the years following the collapse of the Soviet Economic system since the 1990s. This part of our review relies especially on the scholarship of Mansoor and Quillin (2006) and Organiściak-Krzyszkowska (2017). Migration in the EE/FSU represents a large population movement by international standards, both in terms of having large migrant sending and receiving countries.

Migration patterns that existed before World War II, such as seasonal agricultural migration from Poland to Germany (Kępińska and Stark, 2013), were mostly closed off by the imposition of communism. There were exceptions, such as the flows between Eastern Europe and the United Kingdom under the Seasonal Agricultural Worker Scheme (Martin et al., 2008). The breakup of the Soviet Union, Yugoslavia, and

Czechoslovakia in the 1990s created many new smaller countries, and initially migration included high levels of cross-border migration and “statistical migration” associated with people returning to their ethnic or cultural homelands, a possibility that was not available to them earlier, given government restrictions on movement.

Rural residents are an important share of migrants. The Stalinist development model focused on industrialization at the expense of agriculture, using forced rural collectivization, production quotas, low state purchase prices, and state-owned farms to help create a surplus that could be redirected towards investment in producer goods. Eastern European countries usually implemented this model to a lesser extent, as resistance to the Stalinist approach contributed to political tensions in Poland, Hungary, and elsewhere. In Yugoslavia, forced collectivization was rejected by Tito entirely. Nonetheless, after these regimes collapsed, their rural sectors typically faced the highest levels of unemployment and poverty in the transitioning economy, and the shift from collective to private farming led to small-scale and uncompetitive production that became even more problematic as these economies opened up to international trade. The result was a disproportionate motive to migrate, relative to other countries with similar incomes, and a greater need for remittances to support the families they left behind.

The causes and patterns of migration changed rapidly, shifting to an overall more economic motivation. Economic magnets like Russia became a net economic importer in Central Asia, while countries such as Armenia, Albania, Georgia, Kazakhstan, and Tajikistan saw large shares of permanent migrants, especially among the better educated and younger elements of society. In Eastern Europe many migrants left for Western Europe, with Germany and the United Kingdom among the major destinations.

The largest enlargement in the history of the European community took place in 2004, with ten new countries joining the EU, the Czech Republic, Estonia, Cyprus, Lithuania, Latvia, Hungary, Malta, Poland, Slovenia and Slovakia. Three years later, Bulgaria and Romania were accepted. The enlargement of the EU meant the principles of common market became binding for the new member states, which included free movement of goods, people, services, and capital. It is estimated that the number of citizens from these countries residing in the EU-15 increased from 1.66 million in 2004 to 7.3 million in 2016 (Organiściak-Krzyszkowska, 2017). Romania (2.9 million such

individuals in 2016) and Poland (2.5 million individuals in 2016) made up the two highest-ranked countries in terms of the number of citizens residing outside their birth country within that territory.

So substantial was the scale of migration that it has sparked concerns about aging and depopulation of the Eastern European migrant-sending countries. Fihel and Okólski (2019) estimate that net migration (particular of those in their prime working/reproductive age) was responsible for about three-quarters of the 7 percent drop in the population between 1989 and 2018 in the eleven post-Soviet countries that had joined the EU (in contrast to a 13 percent overall increase in the majority of other EU member states).

For many countries in this region, remittances are an important source of external financing, second only to foreign assistance and foreign direct investment. For many of the poorest countries in the region, they represent the largest source of financial capital. Especially in countries such as Moldova, Bosnia and Herzegovina, and Albania, remittance make up anywhere from 15 to 30 percent of GDP (Mansoor and Quillin, 2006).

Remittance patterns in the new European Union member countries, where income levels are higher and cross-country income differentials lower, is substantially different. Here, there is less need for workers to live abroad to support their families' consumption. Moreover, as the economic situation in the country improves, accumulated human and financial capital at home create lower incentives to migrate. According to Eurostat data, the ten countries of Central and Eastern Europe saw an inflow of 166.6 billion euro from those working abroad (Organiściak-Krzyszowska, 2017), with Poland, Romania, and Hungary receiving the highest amounts, and Hungary (3.7%), Latvia (3.1%), and Bulgaria (3.0%) seeing the highest amount transferred as a percentage of GDP.

Previous research on remittances for countries in this region has revealed its significance for economic development and poverty reduction, despite its sensitivity to period factors such as the 2008 financial crisis. This research has focused on Romania, Bulgaria, and Albania (Blouchoutzi and Nikas, 2010), Central and Eastern Europe (Giannetti et al., 2009), Kosovo (Loxha, 2019), and emerging economies in the European Union (Mehedintu et al., 2019). There is also general agreement with research



from other settings about altruism, investment (e.g., in small businesses), and educational-repayment motives, including research on migrants from Central and Eastern Europe (Roman, 2013) and Ukraine (Strielkowski and Sperkova, 2016). For a general overview of motives, see Rapoport and Docquier (2006).

Motivations for remittance-sending notwithstanding, research by Engbersen et al. (2013) on Central and Eastern European migrants (i.e., Poles, Bulgarians, and Romanians) in the Netherlands reveals that remittance amounts vary depending on the underlying patterns of migration. Using psychometric methods, these authors group migrants into a typology according to attachment to, respectively, host and origin country, circular migrants (with a strong commitment to origin, weak commitment to destination), transnational migrants (with a strong commitment to both origin and destination), “footloose” (with a weak commitment to both origin and destination), and settlement migrants (with a weak commitment to origin, strong commitment to destination). They found that migrant types with strong commitments to origin (i.e., circular and transnational) sent remittance amounts that were an order of magnitude higher than those with a weaker attachment (i.e., footloose and settlers).

Parker (2020) used a gravity model to examine the flow of migrants between the countries of Eastern Europe and the rest of the world; while the region had a relatively high share of migrants, it had fewer migrants than income differences and other factors in the model would otherwise predict. But even if it has relatively more migrants, what about the remittances those migrants send home? Are they higher or lower, once we consider other drivers of remittance flows?

### **3. Analysis**

For this analysis, we collected a balanced panel of annual national-level statistics spanning the period after the collapse of the old postwar order. We then specify a subset of those countries as either Eastern European or republics of the Former Soviet Union. Our regressions then show how income, population, and migrant characteristics account for differences in both the inflows and outflows of remittances per migrant, with and without country-specific effects, and comparing the subset of these former socialist economies with the overall sample.

### 3.1. Description of Data

Statistics on remittances received and remittances paid are reported annually by the World Bank (2020) for the majority of 214 countries, though for some the amounts are only sporadically available. *World Development Indicators* also include GDP (in current US dollars, constant dollars, and comparable purchasing-power-parity equivalents), population (including rural and female shares), education spending, and unemployment rates. We also match these observations with the Historical Index of Ethnic Fractionalization dataset (Drazanova, 2019), augmented for a couple of small countries with data from Reynal-Querol (2020) and Fearon (2003).

The number of foreign-born residents, including their gender, origin, and destination, is estimated by the UN (2019) for 232 countries in 1990, 1995, 2000, 2005, 2010, 2015, and 2019, and we interpolate these quinquennial data for the years in between to create an annual dataset that is matched up to the other data. By matching host or origin data to UN or World Bank definitions, we calculate each country's share of emigrants to upper-income countries and their share of immigrants from less-developed countries. We also calculate a Herfindahl-Hirschman Index (HHI) of the dispersion of the countries emigrants move to or immigrants come from, in order to determine whether the concentration of nationalities matters.

In some cases, missing observations are interpolated, but in most cases missing data led to exclusion of the country from our sample. Extending our dataset back to 1990 would exclude too many countries, particularly the formerly socialist economies of interest. We thus emerge with a sample of 93 countries spanning the 25 years from 1995 to 2019. At the start of the sample period, 14 countries in the sample were members of the EU, but by 2019 this count rose to 26 countries. There are 33 OECD members in the sample, and 37 are defined by the World Bank as less-developed countries (LDC). The panel is balanced, as all countries remaining in the sample report both inward and outward remittances along with inward and outward migration.

Table 1. Remittances for Eastern Europe (EE) and Former Soviet Union (FSU)

	Remittances Received (% GDP)			Remittances Paid (% GDP)		
	1995	2005	2019	1995	2005	2019
<b>Sample Average (93)</b>	<b>0.3</b>	<b>0.5</b>	<b>0.7</b>	<b>0.3</b>	<b>0.4</b>	<b>0.5</b>
<b>Subsample Avg (21)</b>	<b>0.3</b>	<b>1.4</b>	<b>1.9</b>	<b>0.6</b>	<b>0.7</b>	<b>1.1</b>
EE Countries (16)	0.3	1.3	1.8	0.5	0.6	1.1
FSU States (12)	0.1	1.0	1.7	0.9	1.0	1.2
<b>EE, not FSU</b>	<b>0.7</b>	<b>2.1</b>	<b>2.5</b>	<b>0.2</b>	<b>0.4</b>	<b>0.9</b>
Poland	0.5	2.1	1.1	0.2	0.2	1.2
Hungary	0.8	0.6	2.9	0.3	0.6	0.9
Czechia	0.3	1.0	1.5	0.2	1.0	1.4
Slovakia	0.1	1.9	2.0	0.01	0.08	0.3
Albania*	17.9	16.0	9.6	..	0.08	0.8
Bulgaria	0.2	5.4	3.4	0.3	0.1	0.3
Romania	0.02	1.0	3.1	0.01	0.02	0.2
Slovenia	1.3	0.7	1.1	0.10	0.2	0.6
Croatia	2.4	4.1	6.6	0.07	0.4	0.9
N. Macedonia	1.4	3.6	2.5	0.02	0.2	0.2
Bosnia & Herzegovina*	..	18.2	11.2	..	0.4	0.4
Montenegro*	..	..	10.5	..	..	2.2
Serbia*	..	..	8.2	..	..	0.6
Kosovo*	..	19.2	15.8	..	4.4	0.5
<b>Both EE and FSU</b>	<b>0.1</b>	<b>0.9</b>	<b>1.6</b>	<b>0.8</b>	<b>0.8</b>	<b>1.2</b>
Estonia	0.03	1.8	1.7	0.08	0.3	0.8
Latvia	0.70	2.2	3.4	0.02	0.1	0.7
Lithuania	0.01	2.9	2.4	0.01	1.0	1.1
Russia	0.04	0.4	0.6	1.00	0.9	1.3
Belarus	0.20	0.7	2.2	0.09	0.2	0.3
Moldova	0.06	30.6	16.0	0.04	1.5	1.5
Ukraine	0.01	2.8	10.3	0.002	0.2	0.4
<b>FSU, not EE</b>	<b>0.8</b>	<b>2.7</b>	<b>3.8</b>	<b>1.3</b>	<b>2.3</b>	<b>1.3</b>
Armenia	4.9	18.7	11.2	1.1	4.2	2.7
Azerbaijan	0.1	4.7	2.7	0.3	1.8	1.3
Georgia	10.5	7.0	12.9	0.4	0.4	1.0
Kazakhstan	0.01	0.1	0.3	2.5	3.3	1.5
Kyrgyzstan	0.07	12.7	28.5	2.5	2.2	6.8
Tajikistan*	..	24.4	28.6	..	3.0	2.3
Turkmenistan*	..	..	0.0	..	..	..
Uzbekistan*	..	..	7.2	..	..	0.5

Note: \* Not included in sample due to insufficient data.

Of the 93 countries in the sample, 21 are formerly socialist republics of Eastern Europe and/or the former Soviet Union. We define Eastern Europe (EE) to first include seven former non-Soviet members of the Warsaw Pact, seven republics of the former Yugoslavia, and with seven republics of the former Soviet Union located west of the Urals. Of the first 14 republics, i.e., those in Eastern Europe that were not part of the Soviet Union, five are excluded from the sample due to missing data. Of the fifteen republics of the Former Soviet Union (FSU), seven are also included in Eastern Europe and three others are excluded due to missing data.

Table 1 reports personal remittances received and paid, relative to GDP, for all 29 republics of Eastern Europe and the former Soviet Union in 1995, 2005, and 2019, although eight of these are excluded from the sample. Weighted averages show that remittances have risen faster than GDP in the EE/FSU subsample, and much faster relative to the overall sample. For the overall sample, remittances received have grown faster than remittances paid, primarily because remittances are more likely to flow from bigger to smaller economies where they have more impact. For the EE/FSU subsample, remittances received have grown substantially faster than remittances paid, after the former started out higher.

### **3.2. Hypotheses and Expectations**

Our first question is whether the conditions for the sender or the recipient of remittances matter more. If the sender's income matters more, then richer countries would send more and receive less. Average income would have a positive coefficient for the sending country but not the receiving country, a greater share of emigrants to rich countries would increase remittances received, while a greater share of immigrants from poor countries would not necessarily affect remittances paid. However, if altruism is the primary motive for remittances then these effects should change, and recipient conditions should matter more.

The second question is whether other characteristics of the sending and receiving countries matter. Does population matter? Does it matter if more migrants are female, or are likely to not be in their peak earning years? Are migrants more likely to send money home when either the society they were born in or the society they live is ethnically homogenous? Are migrants similarly affected by the kind of work they do,

particularly whether they come from or move to a rural society more dependent on agriculture?

Migrants can move between or within countries, and remittances flow internationally and domestically. Because our measure of remittances includes only international remittances, the effect of population on remittances per migrant should be negative, as larger countries are likely to have more internal migrants. If female migration is associated with the movement of entire family units, and not just the temporary migration of individuals, then we should expect an increased female share to have a negative effect. However, female migrants without families should only be less likely to send remittances home if their incomes are lower.

The third question is whether remittances per migrant decline over time. If the remittance motive of migrants is to save for their eventual return, rather than altruism, then remittances may diminish over time for long-term migrants. We test this by including the five-year lag for migrants, though we note this is an imperfect measure with aggregate data since we cannot identify the longevity of individual migrants. More migrants in the past does not necessarily mean that current migrants have been abroad for longer, but we assume these are correlated.

Fourth, are remittances affected by a rising population of migrants? Smaller populations of migrants may be able to exert more social pressure on each other. If they do, we would expect negative coefficients for the migrant share of population, and negative coefficients for the HHI index of migrant concentration. In essence, there would be diminishing returns to migration.

Fifth, does education spending and the unemployment rate matter? More education spending is likely to lead to higher remittances, as higher earnings are more likely for both emigrants from more educated countries and immigrants into more educated countries. Higher unemployment rates may increase the number of emigrants, just as lower unemployment rates may increase the number of immigrants. The effects of unemployment rates on the remittances per migrant, however, are much less clear.

Finally, are the formerly socialist countries of Eastern Europe and the Former Soviet Union different from the rest of our sample? These countries have experienced faster growth in remittances, especially from emigration, but can that difference be adequately explained by differences in other variables included in the analysis? Are

migrants from more rural areas more likely than others, or more likely than those in other countries, to send remittances? Are the migrants both in to and out of this region substantially different in their remittance behavior than those of the rest of the world?

### 3.3. Our Model

Our regression model is simply:

$$\ln\left(\frac{R}{M}\right)_{it} = \sum_k X_{kit} \beta_k + u_{it}$$

For countries ( $i$ ) and each year ( $t$ ) from 1995 to 2019. Our left-hand side variable is the log of real remittances ( $R$ ) per migrant ( $M$ ). Remittances are adjusted for inflation using the World Bank's implicit GDP deflator. For inward flows, we use *RRPE*, or remittances received per emigrant. For outward flows, we use *RPPI*, or remittances paid per immigrant. There are  $k$  right-hand side variables. For both inward and outward flows, the vector of  $X$  variables include:

- $\ln(Inc)$ , the log of real GDP per capita, in 2017 constant international PPP (purchasing power parity) dollars;
- $\ln(Pop)$ , the log of population, in order to control for scaling effects;
- *RPopSh*, the rural share of population;
- *ExRate*, the official exchange rate divided by the PPP equivalent;
- *Frac*, the historical index of ethnic fractionalization;
- *Educ*, the total spending on education divided by GDP;
- *Unemp*, the unemployment rate; and
- *DepRatio*, the total dependency ratio, including both young and old.<sup>1</sup>

Also included for both inward and outward flows are  $T$ , the year minus 1995, and five dummy variables: *EE* for 16 republics in Eastern Europe; *FSU* for 12 former Soviet republics; *OECD* for 33 OECD members; *LDC* for 37 less-developed countries; and *EU* for 14 to 26 members of the European Union.

<sup>1</sup> The inclusion of the dependency ratio is the helpful suggestion of an anonymous referee, who argue that this would affect native labor supply relative to labor demand.

For remittances received per emigrant we add five more variables, and for remittances paid we add seven more. These variables include:

- *EmPopSh* (or *ImPopSh*), the number of emigrants (or immigrants) as a share of population;
- *Em5yrSh* (or *Im5yrSh*), the number of migrants present five years before, as a share of current migrants;
- *EmHHI* (or *ImHHI*), a Herfindahl–Hirschman index calculated for the concentration of emigrant destinations (or immigrant origins), normalized to a maximum of one;
- *EmFemSh* (or *ImFemSh*), the female share of migrants;
- *EmRichSh*, the share of emigrants who reside in richer, more developed economies;
- *ImPoorSh*, the share of immigrants who were born in less-developed countries;
- *ImYngSh*, the share of immigrants under the age of 20; and
- *ImOldSh*, the share of immigrants over the age of 50.

Table 2. Average Values of Variables Used in Regressions

Variable	Sample	EE/FSU	Variable	Sample	EE/FSU
<i>ln(RRPE)</i>	0.345	-0.280	<i>ln(RPPI)</i>	-0.433	-0.709
<i>ln(Inc)</i>	2.546	2.696	<i>ln(Pop)</i>	2.468	1.972
<i>RurPopSh</i>	0.407	0.393	<i>ExRate</i>	0.479	0.352
<i>Frac</i>	0.396	0.332	<i>Educ</i>	0.046	0.043
<i>Unemp</i>	0.082	0.106	<i>DepRatio</i>	0.582	0.477
<i>EE</i>	0.172	0.762	<i>FSU</i>	0.129	0.571
<i>OECD</i>	0.355	0.381	<i>LDC</i>	0.398	0.238
<i>EU</i>	0.229	0.318			
<i>EmPopSh</i>	0.086	0.146	<i>ImPopSh</i>	0.075	0.079
<i>Em5yrSh</i>	0.898	0.931	<i>Im5yrSh</i>	0.949	1.046
<i>EmHHI</i>	0.276	0.267	<i>ImHHI</i>	0.234	0.324
<i>EmFemSh</i>	0.508	0.529	<i>ImFemSh</i>	0.502	0.546
<i>EmRichSh</i>	0.285	0.492	<i>ImPoorSh</i>	0.207	0.024
			<i>ImYngSh</i>	0.184	0.111
			<i>ImOldSh</i>	0.294	0.485

Table 2 compares the unweighted mean values of the variables used in the regression for both the entire sample of 93 countries and the subsample of 21 EE/FSU countries. Remittances received and paid per migrant are both lower in the subsample. Per-capita income is slightly higher, ethnic fractionalization is lower, rural population shares and education spending are comparable, and unemployment rates are higher. Emigrants are a higher share relative to population in the subsample, and there is a larger proportion of both emigrants and immigrants that were living abroad five years prior. Female migrant shares are somewhat higher, and the HHI suggests that immigrants living in EE/FSU countries are more likely to come from a smaller number of countries. Emigrants in the subsample are much more likely to live in richer countries, and immigrants are much less likely to come from poor LDCs. Immigrants into the EE/FSU countries are less likely to be young and much more likely to be old. A slightly larger share of the subsample are OECD members or EU members, a slightly smaller share are LDCs, and of course they are all either EE or FSU countries.

We estimate this model with OLS and a common constant term, but we expect the  $u_{it}$  error terms are not likely to be independent and identically distributed. In our second regression we estimated country-specific fixed effects which require the omission of the *EE*, *FSU*, *OECD*, and *LDC* dummy variables. Though not reported here, we also ran these regressions with year effects and found they made little difference to the coefficient estimates. Third, we estimate a random effects model.

The OLS estimates of pooled data contain both cross-sectional and over-time variation, but are problematic because they do not control for unobservable country characteristics that could potentially bias the estimated coefficients. Hopkins (2009) argues that cross-sectional differences in a panel dataset such as this should be removed to better account for changes over time, and fixed effects estimation is appropriate if the unobserved effects are correlated with the error term.

Mavisakalyan (2011), however, suggests that cross-sectional differences in such a dataset may be more important than changes over time, since fractionalization and immigrant shares change slowly over time. If the unobserved heterogeneity is constant over time and uncorrelated with either the independent variables or the error term, random effects estimation may be more appropriate. In addition, random effects



estimation has the advantage of preserving the cross-sectional variation. While we believe this to be the superior model, we report results for all three.

#### 4. Results

Our regression results for the full sample of 93 countries are shown in Table 3 for remittances received, per emigrant, and in Table 4 for remittances paid per immigrant. Both tables compare the OLS results with fixed effects and random effects. Robust standard errors are clustered by country, and p-values are included in parentheses next to the coefficient estimates.

Table 3. Regression Results for log of Remittances Received per Emigrant, 93 Countries

	OLS		Fixed Effects		Random Effects	
	Coefficient	P-Value	Coefficient	P-Value	Coefficient	P-Value
<i>ln(Inc)</i>	<b>0.607</b>	(0.00)	0.249	(0.40)	<b>0.570</b>	(0.00)
<i>ln(Pop)</i>	-0.078	(0.24)	<b>-2.054</b>	(0.04)	<b>-0.296</b>	(0.00)
<i>RPopSh</i>	0.215	(0.54)	1.090	(0.29)	<b>1.189</b>	(0.00)
<i>ExRate</i>	-0.109	(0.62)	-0.223	(0.35)	-0.064	(0.42)
<i>Frac</i>	-0.264	(0.12)	<b>-2.945</b>	(0.00)	<b>-1.420</b>	(0.00)
<i>Educ</i>	1.053	(0.62)	-2.324	(0.29)	<b>-2.161</b>	(0.01)
<i>Unemp</i>	0.370	(0.51)	-1.034	(0.10)	<b>-0.955</b>	(0.00)
<i>DepRatio</i>	<b>-0.801</b>	(0.05)	<b>-1.339</b>	(0.02)	<b>-0.852</b>	(0.00)
<i>T</i>	0.022	(0.00)	0.033	(0.00)	0.025	(0.00)
<i>EE</i>	-0.191	(0.18)	-		<b>-0.407</b>	(0.00)
<i>FSU</i>	-0.068	(0.72)	-		0.104	(0.53)
<i>OECD</i>	-0.030	(0.88)	-		-0.159	(0.22)
<i>LDC</i>	<b>0.556</b>	(0.00)	-		<b>0.422</b>	(0.00)
<i>EU</i>	<b>0.295</b>	(0.01)	<b>0.308</b>	(0.03)	<b>0.382</b>	(0.00)
<i>EmPopSh</i>	<b>-2.057</b>	(0.00)	<b>-4.031</b>	(0.02)	<b>-2.552</b>	(0.00)
<i>Em5yrSh</i>	-0.287	(0.24)	-0.300	(0.15)	<b>-0.227</b>	(0.00)
<i>EmHHI</i>	-0.057	(0.82)	-0.983	(0.06)	<b>-0.936</b>	(0.00)
<i>EmFemSh</i>	0.176	(0.83)	0.174	(0.89)	0.141	(0.73)
<i>EmRichSh</i>	<b>-0.583</b>	(0.01)	-0.522	(0.26)	<b>-0.595</b>	(0.00)

Note: Coefficients with standard levels of significance are denoted in bold. Robust standard errors are clustered.

Table 4. Regression Results for log of Remittances Paid per Immigrant, 93 Countries

	OLS		Fixed Effects		Random Effects	
	Coefficient	P-Value	Coefficient	P-Value	Coefficient	P-Value
<i>ln(Inc)</i>	0.872	(0.00)	0.752	(0.01)	0.883	(0.00)
<i>ln(Pop)</i>	-0.283	(0.00)	-0.981	(0.27)	-0.329	(0.00)
<i>RPopSh</i>	1.112	(0.00)	1.000	(0.28)	0.955	(0.00)
<i>ExRate</i>	0.480	(0.02)	0.498	(0.01)	0.554	(0.00)
<i>Frac</i>	-0.156	(0.53)	-0.794	(0.26)	-0.593	(0.00)
<i>Educ</i>	1.095	(0.68)	2.460	(0.31)	1.921	(0.05)
<i>Unemp</i>	-1.489	(0.03)	0.719	(0.22)	0.409	(0.19)
<i>DepRatio</i>	-0.781	(0.18)	-0.332	(0.47)	-0.213	(0.19)
<i>T</i>	0.029	(0.00)	0.033	(0.00)	0.030	(0.00)
<i>EE</i>	-0.507	(0.00)	-		-0.646	(0.00)
<i>FSU</i>	0.164	(0.26)	-		0.280	(0.11)
<i>OECD</i>	-0.096	(0.58)	-		-0.197	(0.20)
<i>LDC</i>	-0.144	(0.37)	-		-0.232	(0.14)
<i>EU</i>	-0.009	(0.93)	0.191	(0.08)	0.202	(0.00)
<i>ImPopSh</i>	-2.039	(0.01)	-4.414	(0.00)	-3.816	(0.00)
<i>Im5yrSh</i>	-0.025	(0.82)	-0.031	(0.71)	-0.026	(0.42)
<i>ImHHI</i>	-0.459	(0.31)	-0.465	(0.36)	-0.509	(0.00)
<i>ImFemSh</i>	-4.303	(0.00)	-2.765	(0.01)	-3.098	(0.00)
<i>ImPoorSh</i>	-0.839	(0.00)	0.050	(0.91)	-0.245	(0.06)
<i>ImYngSh</i>	1.572	(0.04)	0.366	(0.53)	0.515	(0.01)
<i>ImOldSh</i>	0.856	(0.12)	0.669	(0.23)	0.804	(0.00)

Note: Coefficients with standard levels of significance are denoted in bold. Robust standard errors are clustered.

#### 4.1. Results for Remittance Inflows

Table 3 shows that host countries with higher income receive more remittances, though this effect is statistically insignificant in the fixed effects model, and the elasticity of income is less than one. This is consistent with the hypothesis that recipient income drives remittance behavior. Population has a negative effect that is not significant in the OLS model, suggesting that countries with slower population growth receive more remittances per emigrant. A larger rural population is only significant in the random effects model, and the overvaluation or undervaluation of the exchange rate appears to have no significant effect. Ethnically-fractionalized countries receive fewer remittances in both the OLS model and the random effects model, but both education spending and the unemployment rate are only significant (and negative) in the random effects model.

Both the dependency ratio and the emigrant share of population have negative effects on remittances per emigrant, and the coefficients are significant across all three models, while the HHI has a negative effect that is significant in both the fixed and random effects models. The latter two results suggest diminishing returns to emigration, particularly when that emigration is concentrated in a small number of countries. The five-year lag has a negative effect that is consistent with the remittance decay hypothesis, but the coefficient is not statistically significant in either the OLS or Fixed Effects models.

The female share of emigrants appears not to matter, but more emigrants to rich countries appears to lead to fewer remittances, not more, and the effect is significant in both the OLS and random effects models. This may be because the higher cost of living in those countries allows fewer savings to be sent back home, or it may mean that economic conditions for migrants may matter less than the economic conditions of the recipient, given the positive coefficient for home country income.

Finally, both EU members and less-developed countries receive more remittances, *ceteris paribus*, while Eastern European countries also receive less, an effect that is significant in the random effects model. Even after adjusting for inflation, population, and the effect of other variables, remittances appear to grow at an average rate of 2-3 percent per year.

If we consider only the random effects model, then smaller, rural, and ethnically-homogeneous countries receive more remittances from their emigrants. Countries which spend more on education receive less, as do countries with higher unemployment rates. More emigrants, especially if they have been away longer or have emigrated to richer countries, results in fewer remittances per migrant. These latter results are consistent with a lower attachment to the sending country found among settlement migrants as describe by Engbersen, et al. (2013).

#### **4.2. Results for Remittance Outflows**

Table 4 reports similar regression results for remittances paid per immigrant, and some are consistently significant across all three models. Average income in the host country has a larger and consistently positive effect on the remittances that immigrants send back to their home countries. More immigrants result in diminishing remittances

per immigrant. Immigrants in Eastern European countries send less home than other countries, *ceteris paribus*, but this may be due to the ease with which migrants can move back and forth across borders and avoid the various costs that formal remittances may have.

Other effects are only significant in the OLS and random effects models, suggesting the primary differences are between countries, not over time. Countries with larger populations pay fewer remittances per immigrant, and countries with more rural populations send more. Countries with more immigrants from poor countries send fewer remittances, while those with younger immigrants send more.

But there are also differences between how these factors affect outflows versus inflows. An overvalued exchange rate results in more remittances paid across all three models, and a greater share of female immigrants results in fewer remittances. Both of these suggest that immigrant earnings and family connections matter. In contrast, the dependency ratio of the host country does not seem to matter as much. Education spending only has a significant effect in the random effects model, and the unemployment rate is only significant with OLS. The five-year lag effect is negative but too small to be significant, and the diminishing effect of concentration measured with the HHI is only significant with random effects.

If we again consider only the random effects model, then smaller, rural, and ethnically-homogeneous countries pay more remittances per immigrant, as do countries with overvalued exchange rates, more spending on education, EU membership, and higher immigrant dependency ratios with both young and old. Countries with more immigrants pay a diminishing amount of remittances per immigrant, especially if those immigrants are female or come from a small number of origins, and Eastern European countries pay less.

#### **4.3. The Former Socialist Economies**

Table 5 show the random effects regressions for the 21-country subsample of Eastern European countries and former Soviet republics. The table shows results for both inward (*RRPE*) and outward (*RPPI*) remittance flows, along with *t*-statistics for the hypothesis that the coefficients are equal to those reported in the entire sample.

For remittances received, home country income does not seem to matter, but its ethnic fractionalization still has a significant and negative effect. The remittances per emigrant are still diminishing, especially when emigrants are concentrated in fewer countries. The home country's population still has a negative effect on remittances, as does its dependency ratio, while remittances increase when more of the emigrants are female. Several of these coefficients are different in the subsample. The coefficients for income, population, the dependency ratio, and EU membership are significantly lower, while the growth rate of remittances is otherwise higher.

Table 5. Random Effects Results for 21-Country EE/FSU Subsample

Dep. Var. = $\ln(\text{RRPE})$				Dep. Var. = $\ln(\text{RPPI})$			
Variable	Coefficient	P-Value	t-Statistic	Variable	Coefficient	P-Value	t-Statistic
$\ln(\text{Inc})$	-0.037	(0.873)	<b>[-2.64]</b>	$\ln(\text{Inc})$	<b>1.255</b>	(0.000)	[1.84]
$\ln(\text{Pop})$	<b>-0.709</b>	(0.000)	<b>[-2.74]</b>	$\ln(\text{Pop})$	-0.037	(0.503)	<b>[5.34]</b>
$\text{RPopSh}$	0.270	(0.683)	[-1.39]	$\text{RPopSh}$	-0.564	(0.089)	<b>[-4.57]</b>
$\text{ExRate}$	-0.484	(0.098)	[-1.44]	$\text{ExRate}$	<b>1.106</b>	(0.000)	<b>[2.17]</b>
$\text{Frac}$	<b>-1.302</b>	(0.000)	[0.33]	$\text{Frac}$	0.236	(0.216)	<b>[4.34]</b>
$\text{Educ}$	-2.900	(0.255)	[-0.29]	$\text{Educ}$	<b>7.427</b>	(0.006)	<b>[2.05]</b>
$\text{Unemp}$	-0.288	(0.567)	[1.32]	$\text{Unemp}$	<b>-1.083</b>	(0.016)	<b>[-3.31]</b>
$\text{DepRatio}$	<b>-4.649</b>	(0.000)	<b>[-7.81]</b>	$\text{DepRatio}$	-0.481	(0.306)	[-0.57]
$T$	<b>0.043</b>	(0.000)	<b>[5.19]</b>	$T$	<b>0.038</b>	(0.000)	<b>[2.30]</b>
$EE$	-0.381	(0.065)	[0.12]	$EE$	<b>-1.092</b>	(0.000)	<b>[-3.86]</b>
$FSU$	0.048	(0.841)	[-0.24]	$FSU$	-0.051	(0.560)	<b>[-3.81]</b>
$OECD$	-0.187	(0.407)	[-0.12]	$OECD$	-0.101	(0.287)	[1.01]
$LDC$	<b>0.571</b>	(0.002)	[0.81]	$LDC$	<b>-0.251</b>	(0.004)	[-0.22]
$EU$	<b>0.186</b>	(0.007)	<b>[-2.87]</b>	$EU$	0.099	(0.213)	[-1.30]
$\text{EmPopSh}$	<b>-3.459</b>	(0.000)	[-1.19]	$\text{ImPopSh}$	<b>-5.908</b>	(0.000)	<b>[-2.66]</b>
$\text{Em5yrSh}$	-0.049	(0.847)	[0.70]	$\text{Im5yrSh}$	<b>0.408</b>	(0.002)	<b>[3.25]</b>
$\text{EmHHI}$	<b>-1.680</b>	(0.000)	[-1.75]	$\text{ImHHI}$	-0.527	(0.101)	[-0.06]
$\text{EmFemSh}$	<b>3.069</b>	(0.046)	[1.90]	$\text{ImFemSh}$	1.576	(0.089)	<b>[5.05]</b>
$\text{EmRichSh}$	-0.470	(0.319)	[0.26]				
				$\text{ImPoorSh}$	-1.934	(0.167)	[-1.21]
				$\text{ImYngSh}$	-0.317	(0.506)	[-1.75]
				$\text{ImOldSh}$	-0.607	(0.045)	<b>[-4.65]</b>

Note: Coefficients with standard levels of significance are denoted in bold, and t-statistics test the hypothesis that the subsample has the same coefficients as the entire sample. Robust standard errors are clustered.

For remittances paid, host country income has a significant and large effect, with an elasticity greater than one. An overvalued exchange rate results in more remittances,

as does more education spending, while a higher unemployment rate results in lower remittances. More immigrants results in diminishing remittances per immigrant, but the five-year lag is positive, not negative. Again, a larger share of female immigrants appears to result in more remittances paid.

Most of these coefficients are significantly different from those in the full sample. The effect of exchange rate overvaluation is larger, along with the positive effects of education spending and the negative effects of the unemployment rate. The negative effect of more immigrants on remittances per immigrant is larger. Coefficients for population, rural population share, ethnic fractionalization, the HHI, and the female share of immigrants all become insignificant in the subsample, while the differences from the full sample are significant. This makes sense given the particular inefficiencies of the rural sectors in these economies and the tendency for female migrants to be relied upon for family support.

Interpreting the dummy variables is a little tricky because the comparison group is much smaller. The *EE* and *FSU* coefficients in the *RPPI* regression, for example, are significantly lower than in the full sample, but all countries in the subsample are one or the other or both. Five of the countries in the subsample are considered to be less-developed countries, and the coefficient for these countries is higher for remittances received and lower for remittances paid. In the majority of cases, however, the dummy coefficients are not significantly different.

## 5. Conclusion

In this study, we estimated a simple model for bilateral flows of remittances per migrant, for a sample of 93 countries over 25 years. While this sample accounts for less than half of all countries, it includes 75% of the world's population and at least 85% of world GDP (if we don't adjust for purchasing power parity, this rises to 89%). We also considered how a subsample of 21 former socialist countries in Eastern Europe and the former Soviet Union might differ from the other countries.

What can we conclude from these different regressions? First, there is evidence that more migrants lead to fewer remittances per migrant, for both inflows and outflows. We also estimated an HHI index to determine whether the concentration of migrants matters and found evidence that it also reduces remittances per migrant. There

is weak evidence for remittances diminishing over time, but this may be due to identification problems since our five-year lag measure considers whether migrant populations are stable, not whether individual migrants are remaining abroad for longer times. All things equal, richer countries both send and receive more remittances per migrant, but so do countries with more rural populations. Finally, countries with a higher index of ethnic fractionalization both send and receive fewer remittances, but this does not hold for remittances from countries in the EE/FSU subsample

In many ways, however, our subsample of once socialist countries in Eastern Europe and the Former Soviet Union does not fit with the rest of the sample. We estimate our model for the subsample separately, and we estimate it with different coefficients within the larger sample.

Taken together with research by Parker (2020), who showed that the Eastern European region had a relatively high share of immigrants, findings from this study paint a picture of remittances in Eastern Europe and the Former Soviet Union as indicative of a larger trends toward demographic decline and economic stagnation and a mix of migration patterns with distinct underlying motivations for sending remittances. As both Grant (2019) and Fihel and Okólski (2019) point out, although variation across countries within the region exist, the Central and Eastern European region as a whole has been experiencing large-scale depopulation (especially in rural areas) due to a combination of low fertility, high mortality, and mass out-migration. Both the collapse of the Soviet Union and enlargement of the European Union, which have allowed for greater freedom of movement, fueled a migration exodus of men and women intent on settling in their host countries.

This exodus has not translated into widespread investment by migrants in their sending countries as in other settings such as Mexican immigration to the United States (Goldring, 2004). The negative effect of emigration/immigration on remittances, in particular, points to a siphoning off the productive labor from Eastern Europe and the Former Soviet Union, which portends a widening of economic disparities between Eastern and Western Europe exacerbated by decades of state socialism. Despite this possibility, the positive coefficients for share of rural population (both remittances paid and received) are more indicative of migrants moving out of rural areas, perhaps to work as seasonal agriculture laborers at destination, and sending back remittances to

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invest in the family farm or to supplement the income of rural households. The legacy of state socialist farm collectivization schemes, which translated in large scale rural unemployment and undercapitalization even in the aftermath of the fall of the Soviet Union, no doubt contributed to this trend.

Our findings should be considered in light of some limitations to our approach. In particular, we lack migration-stream-specific data on remittances for migration from particular sending and receiving countries, thus our analysis is limited with regard to understanding the process by which migrants leave their origin country, establish themselves in a destination country, and perhaps experience a remittance decay effect over time. Despite its limitations, our study makes an important contribution to the literature on aggregate patterns of migrant remittances by considering the case of Eastern Europe and the Former Soviet Union, a region that has received limited attention in the empirical literature. We leave it to future research to address issues of stream-specific remittance patterns.



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